Transport Network Analysis and Regional Development of Hazaribag District, Jharkhand

Research Proposal for the registration in PhD program

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Title of the Ph.D Research Project- **Transport Network Analysisand Regional Development of Hazaribag District, Jharkhand**

A BRIEF INTRODUCTION OF THE RESEARCH TOPIC

The transport network plays a crucial role in regional development by enhancing accessibility, promoting economic growth, and improving overall living standards. In the context of Hazaribag District, Jharkhand, India, an in-depth analysis of the existing transport network's efficiency, connectivity, and accessibility is essential to identify potential areas for improvement. This research proposal aims to conduct a comprehensive study on the transport network of Hazaribag District and its impact on regional development. Transport network analysis is closely related to regional development as it influences accessibility, economic growth, urbanization, investment attractions, tourism, environmental sustainability, and social inclusion. Properly planned and a managed transport infrastructure can significantly contribute to the overall development and prosperity of a region.

1. STATE OF THE ART

Transport represents one of the most important human activities worldwide, it is an important component of the economy and plays an important role in spatial relation between different locations. Transportation is such an activity that has carried importance in many aspects like: historical, social, economic, political, and environmental. Ronald McQuaid, Malcolm Grieg, Austin Smyth and James Cooper in –"The importance of transport in business location decisions" talked about the role of transport in decision making for the location and relocation of the business site which has a great impact on human society. Similarly, we can see some work of Scott Leitham, Ronald W McQuaid, John D Nelson, where they tried to investigate the importance of transport in industrial location and its impacts. For a town where the scope for the development is much wider in upcoming years because of its locational factor and industrial development sites, transport plays an immense role in the same, and acts as a driving force for the socio-economic development of the people living there. Wheeler (1973) proposed a policy-oriented transport study in which social and economic themes become much more integrated. A study by the Welsh Economy Research Unit (1997) on economic development in Merthyr implies that improved road access has been an important factor in influencing the location decisions of recent investors. High-density transport infrastructure and highly connected networks are commonly associated with high levels of development. Transport development undoubtedly leads to regional development by increasing the movement of people and freights but on the other hand it has some negative impacts on the environment as well. Dipti Ranjan (2020) in 'An economic analysis of improvement in road infrastructure' stated that High quality

road network increases the potential of any economic system by helping both consumer and producer. Talking about the region we can define a region as a geographic or areal unit with certain limits and bounds. The unit may consist of a few villages or a number of countries, (R.P Mishra) in *On The Concept of Region and Regional Development*. There is a positive correlation between road transport network and regional development. Region with good transport accessibility and connectivity has high potential for development. The extension of road network to rural areas helps in converting fallow and wasteland into cultivable and agriculture marketing, growth in rural industries with expanded market and social transformation through greater accessibility to basic amenities, (Krishna Kumar and Anjan Sen, 2014) in *Road Transport and Regional Development*: A Case Study Of Gaya District. It helps in sustained economic growth, increases the productivity, helps in increment in regional development and increases competitiveness. Development and changes of land uses influence the transportation system and on the other hand, development and changes of the transportation system affect land use patterns, for example, development of a new highway leads to changes in surrounding land uses and degradation of the environment. So the researches has already been done on large cities but for a developing small town which has a crucial location for the development in upcoming years there is need to do some researches and bring some conclusions that might be of some help.

2. PROBLEMS TO BE INVESTIGATED:

1. What is the current state of the transport network in Hazaribag District, including roadways, railways, and other modes of transportation?
2. What is the pattern of urban rural commodity flow in the district?
3. What role does intraregional commodity flow plays in delimitation of functional region of the district?
4. Assess how intraregional commodity flow influences regional development including job creation, economic growth, and infrastructure development.

The study focuses on the role of transport network on the regional development of the Hazaribag district. High-density transport infrastructure and highly connected networks are commonly associated with high levels of development. When transport systems are efficient,

they provide economic and social opportunities and benefits that result in positive multiplier effects, such as better accessibility to markets, employment, and additional investments.

3. OBJECTIVE OF THE INVESTIGATION AND MOTIVATION

- To study the current state of the transport network in Hazaribag District, including roadways, railways, and other modes of transportation
- To analyse the relationship between transport network and parameters of regional development in the district
- Delineating functional region by the flow analysis of the intraregional commodity flow in the district
- To study the influence of intraregional commodity flow on the regional development

4. RESEARCH HYPOTHESIS

To carry forward this study we will take certain presumed conditions. The validity of these conditions will be under investigation throughout the study. After concluding the whole study, we will be able to examine these hypotheses one by one. And the credibility of the research will be tested using suitable statistical tools. This analysis will provide our final Result for this study of our presumed view is as following:

- Hazaribag district has well developed transport network to support economic activity and regional development

- There is a positive relation between growing transport network and socio-economic development of the district

- The efficiency of transportation infrastructure within a region positively correlates with the volume of intraregional commodity flow

5. RESEARCH DESIGN AND METHODOLOGY

STUDY AREA:

Hazaribag district is situated in the northern part of Jharkhand. It lies between latitude 23°36'N and 24°39'N and longitude 85°00'E and 85°57'E. The district is bordered by Koderma district

in the north, Giridih district to the east, Chatra district to the west, and Ranchi and Ramgarh in the south. the topography of Hazaribag district is characterized by hilly terrain, plateaus, and dense forests. The district is part of the Chota Nagpur Plateau, which is a region known for its extensive mineral resources and rich biodiversity. As of 2021, the projected population of Hazaribag district was around 1.73 million people. It serves as the administrative headquarters of the Hazaribag district. The transportation facilities in Hazaribag include:

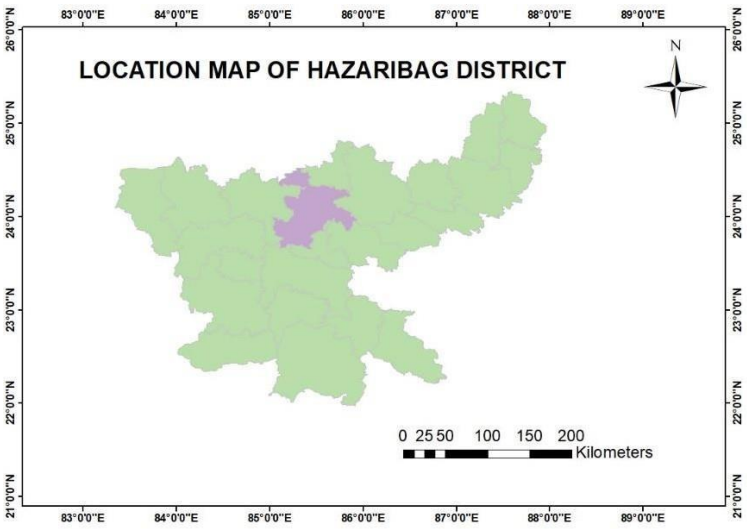
Roadways: Hazaribag is well-connected by road to major cities and towns in Jharkhand and neighbouring states. The National Highway NH-33 passes through the city, providing connectivity to cities like Ranchi and Jamshedpur.

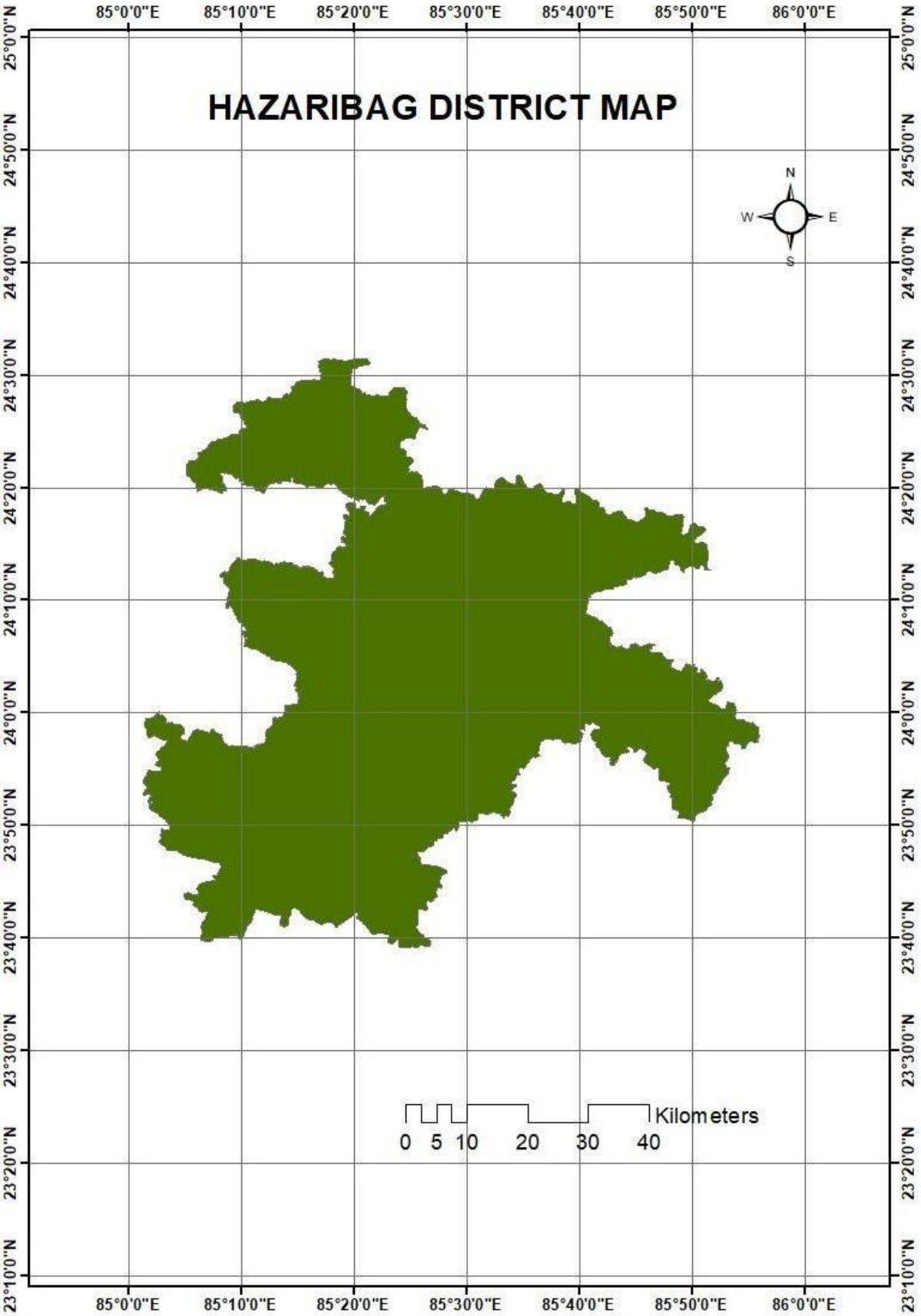
Railways: Hazaribagh Town Railway Station (station code HZBN) is a new railway station under East Central Railway of Dhanbad division and is located on NH100, Kumhar Toli in Hazaribagh district of Jharkhand state. Patna - Ranchi Vande Bharat Express and other trains halt at Hazaribagh Town railway station. Hazaribag has a another railway station known as "Hazaribag Road," which is connected to the Indian Railways network. Trains from major cities like Ranchi, Patna, Kolkata, and Delhi connect to Hazaribag Road railway station

Airports: The nearest major airport to Hazaribag is Birsa Munda Airport in Ranchi, which is approximately 100 kilometres away. It operates domestic flights to major cities in India.

Public Transportation: Hazaribag has local public transportation options, including buses and auto-rickshaws, which facilitate travel within the city and nearby areas.

Hazaribag is known for its diverse economic activities. Here are some of the significant economic activities in Hazaribag: Agriculture, mining, sericulture, handicrafts, small scale industries, education sectors and services.




HAZARIBAG DISTRICT MAP
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85°10'0"E
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85°40'0"E
85°50'0"E
86°0'0"E
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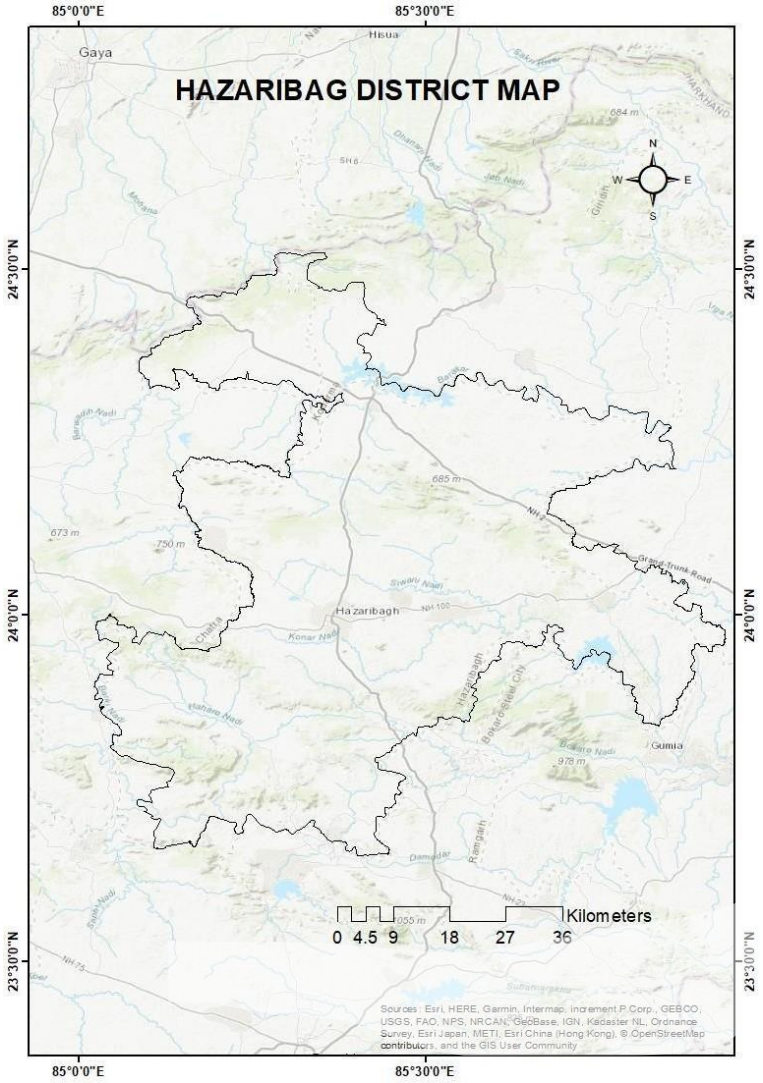

For the research being carried out there is need to collect data primary and secondary. Descriptive research is needed to know the socio-economic change and the regional development due to increase in the transport network of the area.

PRE-FIELD WORK: In this section we will collect the satellite imagery of the district of different time periods and identify the physical changes that has been occurred. And reviewing different reports and data other published and unpublished literature very important before field study.

FIELD WORK: on the field primary data can be collected through surveys, interviews, and focus group discussions with manufacturers, government officials, industry experts, and other. And secondary data can be collected from government reports, census data, industrial publications and other reports on the area.

POST-FIELD WORK: Data collected will be stored and processed, and the suitable statistical tool will be applied to carry out the desired result from the research data. At last proper description and interpretation of the data will be done in order to reach the goal of the research.

Database- for this study a database will be created. It will consist data from secondary and primary survey.

Secondary data - Transport network include road of different size, and importance, Railway routes, Airport, and water ways if any. Sources include (Ministry of road transport and highways).

For the assessment of regional development in the district secondary data will be used which can be obtained from census of India and other organisations. some primary survey of households will be carried out in selected villages.

Sampling design: To verify the road condition particularly lesser important roads like village road, some primary sites will be surveyed in some of the blocks. To select samples site of the village road, we will first create a database of village roads of whole district, then we will be selecting 6 blocks for further primary survey. Based on road network density of village road out of total road network density in the block. Out of these 6 blocks we will select 3 blocks with highest road network density and 3 block from lowest road network density. we can randomly select 5 villages/wards of the urban area and village roads from each selected block for sample survey.

To obtain socio economic data of households of the area we will be selecting about 5 to 6 households from each selected villages/ ward. For this we will be preparing schedule and questionnaire.

Around 180 respondents will be chosen as a sample for the survey.

Tentative Chapterisation

-Introduction

Chapter 1- Geographical background

Chapter 2- Current status of Transport Network in Hazaribag

Chapter 3- Role of transport network in regional development of the district

Chapter 4- Intraregional commodity flow and delineation of functional region in the district

Chapter 5- patterns of parameters of socio-economic development in the district

Chapter 6-Measuring level of Regional Development.

Chapter 7-Evaluating projects and Planning of Network Development.

Chapter 8- Issues, challenges and suggestions of Regional Development in the district

-Conclusion

- Reference

6. SOURCES OF DATA AND TOOLS TO BE USED IN COLLECTION OF DATA

For the study of physical changes over surface of the earth satellite imagery will be used to identify and detect the changes taking place for a certain period of time. Spatial analysis techniques will be used to assess the accessibility and connectivity of regions through transportation systems.

For study of socio-economic condition of the people- survey and interview can be conducted in households. Some secondary data will also be used for understanding the pattern of economic activities that has been carried out from the past years. Data will be collected for the examination of socio economic condition in the district which will include parameters like (per capita income, literacy rate, level of education, sex ratio, infant mortality rate.)

For demographic changes census data will be used as a secondary source to identify the change in population of the district.

7. ANALYSIS OF DATA

The above generated data can be analysed through different suitable tools. For the quantitative analysis it will include studying the change detection transport network of the area. Network analysis tool will be used to study the transport accessibility and connectivity of the area, for this GIS software will be used like ARCGIS, QGIS, ERDAS. And for the qualitative analysis of the data surveys, interviews, questionnaire will be used to collect the data for Socio-economic indicators used to measure the impact of transport networks on regional development So, the both the qualitative and quantitative analysis of the data is required for the best results to be carried out.

INFERENTIAL ANALYSIS:

Parameter estimation and hypothesis testing can be done on a chosen sample taken from the population. The results of the analysis of the sample reflects the nature of the population. The credibility of the hypothesis will be tested using suitable statistical tools .

8. SIGNIFICANCE OF THE STUDY

For a developing area like Hazaribag, where there is great diversity in population of urban and rural, transport network plays an important role in eliminating these disparities by providing easy access and connectivity to the marginal population. It plays an important role in reducing regional disparities and in improving the competitiveness of regions, by facilitating trade, the movement of labour, and economies of scale. For a place like Hazaribag the study becomes important as the growing population in the district demands a planned and managed transportation network for a better functioning of the society be it in terms of economy, social amenities, easy access to the market for the rural areas all these factors contribute to the overall development of the region and creates a platform for the future investment and infrastructure planning for governments and businesses which is essential for making informed decisions about investments in new infrastructure or upgrading the existing one.

9. ITS RELEVANCE TO PRESENT DAY PROBLEM AND NEED TO THE SOCIETY

The study will help to know the current scenario of the district with the development in transport system, and will be able to relate it to the effects it has caused to the human society and the environment. Talking about the present day scenario transportation plays an important role in the development of any place and for an emerging place like Hazaribag which holds a great potential for the regional development in upcoming years, and the growing population the study becomes important as transport network analysis helps in designing better transportation systems, such as roadways, railways, public transit routes, and bike lanes, to ease traffic congestion and improve accessibility. Unplanned and unmanaged traffic can be a cause to many accidents so the transport network analysis allows identifying accident-prone areas and hazardous traffic conditions. By understanding these issues, safety measures can be implemented to reduce the number of accidents and ensure safer travel. Transport network

analysis forms the foundation for predictive models that can anticipate future transportation demands and challenges. This allows proactive planning and preparation for future growth.

CONTRIBUTION TO THE EXISTING KNOWLEDGE

The state of art section has explained through the words of many scholars and reports that transportation plays a key role in the development of any region specially region with economic backwardness, Filani (2000) have examined that the country that plays with its road transport development undermines the major engines that propels the socio economic, integration and development. Road infrastructure gives better opportunities for the individual mobility and better quality of life. Robert E Beazley have talked about the socio economic impact of roads in Nepal in which he discussed the positive and negative impacts of the road transport development, so this motivates to study the area that have remained untouched and with great potential to develop in future, it will be a good step to study the impacts of road transport development in the area which has a diverse population with different sectors of economy and people more in the rural areas. Network analysis is of paramount interest to the transportation planner because transport flows take place on transport networks. Transport flows can be defined as the movement of goods and services between places (Okoko, 2006)

10. FUTURE WORK

The future efforts may identify many more upcoming analyses of the regions that are needed to be studied which are having capacity for future development in terms of transportation infrastructure. And contribution to be made to the country's GDP becomes important, and for the people of the area development in different sectors resulting in better quality of life, the work maybe expanded to other areas to probably study more on the effects which may include the sustainability. By studying transport networks, planners can identify areas with limited access to transportation options, resulting in social inequities. Addressing these disparities can promote inclusivity and equal opportunities for all residents.

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